

WHAT IS CLAIMED IS:

1. A communication system comprising:
 2. transmission equipment that is assigned to a particular origination path, encodes user signals originating at or near the transmission equipment based on the origination path and a particular destination path, and transmits the encoded user signals on the particular origination path;
 6. switching equipment that receives the encoded user signals on the particular origination path, routes the encoded user signals at a path level, and transmits the encoded user signals on the particular destination path; and
 9. reception equipment that is assigned to the particular destination path, receives the encoded user signals on the particular destination path, and decodes the user signals.
1. 2. The system of claim 1, wherein the particular origination path is a particular origination beam and the particular destination path is a particular destination beam and the switching equipment routes the encoded user signals at a beam level.
1. 3. The system of claim 1, wherein the switching equipment is located on a satellite and the transmitting and reception equipment are ground-based.
1. 4. The system of claim 1, wherein the transmission equipment is assigned to a particular origination path based on geographic location.
1. 5. The system of claim 1, wherein the reception equipment is assigned to a particular destination path based on geographic location.
1. 6. The system of claim 1, wherein the switching equipment includes a controller that dynamically re-routes the encoded user signals received from the transmission equipment to alternative switching equipment that receives the re-routed, encoded, user signals, routes the re-routed, encoded, user signals at a user level and transmits the re-routed encoded user signals to the reception equipment.
1. 7. The system of claim 1, wherein the origination or reception equipment is mobile.
1. 8. The system of claim 7, wherein the controller dynamically re-routes the encoded user signals when a total number of origination paths and destination paths used

3 in the system exceed or falls below the number of system users by a predetermined
4 threshold or a predetermined system condition occurs.

1 9. The system of claim 8, wherein the predetermined system condition
2 affects the effective communication of user signals within the system.

1 10. The system of claim 1, wherein the switching equipment determines to
2 which destination path an encoded user signal is destined.

1 11. The system of claim 1, wherein the switching equipment is located on a
2 satellite;

3 the transmission equipment encodes user signals and transmits the encoded user
4 signals to the satellite via the origination path; and

5 the reception equipment receives the encoded user signals from the switching
6 equipment on the satellite via the destination path.

1 12. The system of claim 1, wherein the transmission equipment encodes
2 user signals from a plurality of users and transmits the encoded user signals to a satellite
3 via the origination path.

1 13. The system of claim 1, where the reception equipment receives the
2 encoded user signals from the switching equipment on the satellite via the destination
3 path, decodes the encoded user signals, and distributes the decoded user signals to at least
4 one receiving user.

1 14. The system of claim 1, wherein routing information is encoded in the
2 user signals transmitted by the transmission equipment.

1 15. The system of claim 14, wherein the switching equipment uses the
2 routing information to route the encoded user signals to the destination path.

1 16. The system of claim 1, wherein the transmitting and reception
2 equipment use a spread spectrum technique to transmit the encoded user signals.

1 17. The system of claim 1, wherein the switching equipment determines the
2 origination path and destination path of an encoded user signal based on unique path-
3 specific information.

1 18. A communication method comprising:
2 assigning transmission equipment to a particular origination path;

3 encoding user signals based on the origination path and a particular destination
4 path;

5 transmitting the encoded, user signals on the particular origination path;
6 receiving the encoded, user signals on the particular origination path;
7 routing the encoded, user signals at a path level;
8 transmitting the encoded, user signals on the particular destination path;
9 receiving the encoded, user signals on the particular destination path; and
10 decoding the encoded, user signals.

1 19. The communication method of claim 18, wherein the particular
2 origination path is an origination beam and the particular destination path is a destination
3 beam.

1 20. The communication method of claim 19, wherein routing is performed
2 based on beam codes encoded in the encoded, user signals.

1 21. The communication method of claim 20, wherein encoding the encoded,
2 user signals encodes the user signals with beam codes associated with the particular
3 origination beam and beam codes associated with the particular destination beam.

1 22. The communication method of claim 18, further comprising:
2 re-routing the encoded user signals received on the origination path to alternative
3 switching equipment;
4 receiving the re-routed, encoded, user signals; and
5 routing the received, re-routed, encoded, user signals at a user level.

1 23. The method of claim 22, further comprising:
2 monitoring total number of origination and destination paths and total number of
3 users;

4 comparing total number of origination and destination paths and total number of
5 users; and
6 selectively performing re-routing the encoded, user signals to alternative switching
7 equipment based on results produced by the step of comparing.

1 24. The method of claim 18, further comprising:
2 monitoring for occurrence of a predetermined system condition;

3 selectively re-routing the encoded user signals received on the origination path to
4 alternative switching equipment based on results produced by the step of monitoring;
5 receiving the re-routed, encoded, user signals; and
6 routing the received, re-routed, encoded, user signals at a user level.

1 25. The method of claim 24, wherein the predetermined system condition
2 affects the effective communication of encoded, user signals.